

What is claimed is:

1. A rolling bearing, which is lubricated with a grease,  
comprising:

an outer ring having a rolling raceway track on its inner  
5 peripheral surface;

an inner ring having a rolling raceway track on its outer  
peripheral surface;

a plurality of rolling elements disposed between the  
respective raceway tracks of the outer ring and the inner ring;

10 and

a retainer having a plurality of pockets for locking the  
rolling elements to freely roll and formed of resin material,

wherein when a diameter of the rolling element is taken  
as  $D_a$ , a radial clearance gap between a pocket face of the pocket  
15 and a rolling face of the rolling element is taken as  $\delta r$ , and  
an axial clearance gap between the pocket face of the pocket  
and the rolling face of the rolling element is taken as  $\delta a$ ,  
in the case where a kinematic viscosity of base oil at 40°C  
of the grease is 10 to 40 mm<sup>2</sup>/sec, at least one of the pockets  
20 of the retainer is shaped so that the radial clearance gap ratio  
 $\delta r/D_a$  is  $0 \leq \delta r/D_a \leq 0.09$ , and the axial clearance gap ratio  $\delta a/D_a$   
is  $0 \leq \delta a/D_a \leq 0.06$ .

2. A rolling bearing, which is lubricated with a grease,  
25 comprising:

an outer ring having a rolling raceway track on its inner peripheral surface;

an inner ring having a rolling raceway track on its outer peripheral surface;

5 a plurality of rolling elements disposed between the respective raceway tracks of the outer ring and the inner ring; and

a retainer having a plurality of pockets for locking the rolling elements to freely roll and formed of resin material,

10 wherein when a diameter of the rolling element is taken as  $D_a$ , a radial clearance gap between a pocket face of the pocket and a rolling face of the rolling element is taken as  $\delta_r$ , and an axial clearance gap between the pocket face of the pocket and the rolling face of the rolling element is taken as  $\delta_a$ ,  
15 in the case where a kinematic viscosity of base oil at 40°C of the grease is 10 to 90 mm<sup>2</sup>/sec, at least one of the pockets of the retainer is shaped so that the radial clearance gap ratio  $\delta_r/D_a$  is  $0 \leq \delta_r/D_a \leq 0.09$ , and the axial clearance gap ratio  $\delta_a/D_a$  is  $0 \leq \delta_a/D_a \leq 0.05$ .

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3. A rolling bearing, which is lubricated with a grease, comprising:

an outer ring having a rolling raceway track on its inner peripheral surface;

25 an inner ring having a rolling raceway track on its outer

peripheral surface;

a plurality of rolling elements disposed between the respective raceway tracks of the outer ring and the inner ring;  
and

5 a retainer having a plurality of pockets for locking the rolling elements to freely roll and formed of resin material,  
wherein when a diameter of the rolling element is taken as  $D_a$ , a radial clearance gap between a pocket face of the pocket and a rolling face of the rolling element is taken as  $\delta_r$ , and  
10 an axial clearance gap between the pocket face of the pocket and the rolling face of the rolling element is taken as  $\delta_a$ ,  
in the case where a kinematic viscosity of base oil at 40°C of the grease is 10 to 160 mm<sup>2</sup>/sec, at least one of the pockets of the retainer is shaped so that the radial clearance gap ratio  
15  $\delta_r/D_a$  is  $0 \leq \delta_r/D_a \leq 0.09$ , and the axial clearance gap ratio  $\delta_a/D_a$  is  $0 \leq \delta_a/D_a \leq 0.025$ .

4. The rolling bearing according to claim 1, wherein the pockets of the retainer, each of which is shaped so that the  
20 radial clearance gap ratio  $\delta_r/D_a$  is  $0 \leq \delta_r/D_a \leq 0.09$ , and the axial clearance gap ratio  $\delta_a/D_a$  is  $0 \leq \delta_a/D_a \leq 0.06$ , are disposed at substantially equal spaces in at least three places.

5. The rolling bearing according to claim 2, wherein the  
25 pockets of the retainer, each of which is shaped so that the

radial clearance gap ratio  $\delta r/Da$  is  $0 \leq \delta r/Da \leq 0.09$ , and the axial clearance gap ratio  $\delta a/Da$  is  $0 \leq \delta a/Da \leq 0.05$ , are disposed at substantially equal spaces in at least three places.

5           6. The rolling bearing according to claim 3, wherein the pockets of the retainer, each of which is shaped so that the radial clearance gap ratio  $\delta r/Da$  is  $0 \leq \delta r/Da \leq 0.09$ , and the axial clearance gap ratio  $\delta a/Da$  is  $0 \leq \delta a/Da \leq 0.025$ , are disposed at substantially equal spaces in at least three places.

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7. A fan motor using a rolling bearing lubricated with a grease, the rolling bearing comprising: an outer ring having a rolling raceway track on its inner peripheral surface; an inner ring having a rolling raceway track on its outer peripheral surface; a plurality of rolling elements disposed between the  
15   respective raceway tracks of the outer ring and the inner ring; and a retainer having a plurality of pockets for locking the rolling elements to freely roll and formed of resin material, wherein when a diameter of the rolling element is taken as  $Da$ ,  
20   a radial clearance gap between a pocket face of the pocket and a rolling face of the rolling element is taken as  $\delta r$ , and an axial clearance gap between the pocket face of the pocket and the rolling face of the rolling element is taken as  $\delta a$ , in the case where a kinematic viscosity of base oil at 40°C of the  
25   grease is 10 to 40 mm<sup>2</sup>/sec, at least one of the pockets of the

retainer is shaped so that the radial clearance gap ratio  $\delta r/Da$  is  $0 \leq \delta r/Da \leq 0.09$ , and the axial clearance gap ratio  $\delta a/Da$  is  $0 \leq \delta a/Da \leq 0.06$ .

5           8. A fan motor using a rolling bearing lubricated with  
a grease, the rolling bearing comprising: an outer ring having  
a rolling raceway track on its inner peripheral surface; an  
inner ring having a rolling raceway track on its outer peripheral  
surface; a plurality of rolling elements disposed between the  
10   respective raceway tracks of the outer ring and the inner ring;  
and a retainer having a plurality of pockets for locking the  
rolling elements to freely roll and formed of resin material,  
wherein when a diameter of the rolling element is taken as  $Da$ ,  
a radial clearance gap between a pocket face of the pocket and  
15   a rolling face of the rolling element is taken as  $\delta r$ , and an  
axial clearance gap between the pocket face of the pocket and  
the rolling face of the rolling element is taken as  $\delta a$ , in the  
case where a kinematic viscosity of base oil at 40°C of the  
grease is 10 to 90 mm<sup>2</sup>/sec, at least one of the pockets of the  
20   retainer is shaped so that the radial clearance gap ratio  $\delta r/Da$   
is  $0 \leq \delta r/Da \leq 0.09$ , and the axial clearance gap ratio  $\delta a/Da$  is  
 $0 \leq \delta a/Da \leq 0.05$ .

          9. A fan motor, using a rolling bearing lubricated with  
25   a grease, the rolling bearing comprising: an outer ring having

a rolling raceway track on its inner peripheral surface; an inner ring having a rolling raceway track on its outer peripheral surface; a plurality of rolling elements disposed between the respective raceway tracks of the outer ring and the inner ring;  
5 and a retainer having a plurality of pockets for locking the rolling elements to freely roll and formed of resin material, wherein when a diameter of the rolling element is taken as  $D_a$ , a radial clearance gap between a pocket face of the pocket and a rolling face of the rolling element is taken as  $\delta_r$ , and an  
10 axial clearance gap between the pocket face of the pocket and the rolling face of the rolling element is taken as  $\delta_a$ , in the case where a kinematic viscosity of base oil at 40°C of the grease is 10 to 160 mm<sup>2</sup>/sec, at least one of the pockets of the retainer is shaped so that the radial clearance gap ratio  
15  $\delta_r/D_a$  is  $0 \leq \delta_r/D_a \leq 0.09$ , and the axial clearance gap ratio  $\delta_a/D_a$  is  $0 \leq \delta_a/D_a \leq 0.025$ .

10. The fan motor using a rolling bearing according to claim 7, wherein the pockets of the retainer, each of which  
20 is shaped so that the radial clearance gap ratio  $\delta_r/D_a$  is  $0 \leq \delta_r/D_a \leq 0.09$ , and the axial clearance gap ratio  $\delta_a/D_a$  is  $0 \leq \delta_a/D_a \leq 0.06$ , are disposed at substantially equal spaces in at least three places.

25 11. The fan motor using a rolling bearing according to

claim 8, wherein the pockets of the retainer, each of which is shaped so that the radial clearance gap ratio  $\delta r/Da$  is  $0 \leq \delta r/Da \leq 0.09$ , and the axial clearance gap ratio  $\delta a/Da$  is  $0 \leq \delta a/Da \leq 0.05$ , are disposed at substantially equal spaces in at least three places.

12. The fan motor using a rolling bearing according to claim 9, wherein the pockets of the retainer, each of which is shaped so that the radial clearance gap ratio  $\delta r/Da$  is  $0 \leq \delta r/Da \leq 0.09$ , and the axial clearance gap ratio  $\delta a/Da$  is  $0 \leq \delta a/Da \leq 0.025$ , are disposed at substantially equal spaces in at least three places.

13. A rolling bearing, which is lubricated with a grease, comprising:

an outer ring having a rolling raceway track on its inner peripheral surface;

an inner ring having a rolling raceway track on its outer peripheral surface;

a plurality of rolling elements disposed between the respective raceway tracks of the outer ring and the inner ring; and

a retainer having a plurality of pockets for locking the rolling elements to freely roll and formed of resin material,

wherein when a diameter of the rolling element is taken

as  $D_a$ , a radial clearance gap between a pocket face of the pocket and a rolling face of the rolling element is taken as  $\delta_r$ , and an axial clearance gap between the pocket face of the pocket and the rolling face of the rolling element is taken as  $\delta_a$ ,  
5 in the case where the grease including a base oil of a pour point of  $-30^{\circ}\text{C}$  or lower is used, at least one of the pockets of the retainer is shaped so that the radial clearance gap ratio  $\delta_r/D_a$  is  $0 \leq \delta_r/D_a \leq 0.09$ , and the axial clearance gap ratio  $\delta_a/D_a$  is  $0 \leq \delta_a/D_a \leq 0.06$ .

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14. The rolling bearing according to claim 13, wherein the pockets of the retainer, each of which is shaped so that the radial clearance gap ratio  $\delta_r/D_a$  is  $0 \leq \delta_r/D_a \leq 0.09$ , and the axial clearance gap ratio  $\delta_a/D_a$  is  $0 \leq \delta_a/D_a \leq 0.06$ , are  
15 disposed at substantially equal spaces in at least three places.

15. A fan motor using a rolling bearing lubricated with a grease, the rolling bearing comprising: an outer ring having a rolling raceway track on its inner peripheral surface; an  
20 inner ring having a rolling raceway track on its outer peripheral surface; a plurality of rolling elements disposed between the respective raceway tracks of the outer ring and the inner ring; and a retainer having a plurality of pockets for locking the rolling elements to freely roll and formed of resin material,  
25 wherein when a diameter of the rolling element is taken as



Da, a radial clearance gap between a pocket face of the pocket and a rolling face of the rolling element is taken as  $\delta r$ , and an axial clearance gap between the pocket face of the pocket and the rolling face of the rolling element is taken as  $\delta a$ ,  
5 in the case where the grease including a base oil of a pour point of  $-30^{\circ}\text{C}$  or lower is used, at least one of the pockets of the retainer is shaped so that the radial clearance gap ratio  $\delta r/Da$  is  $0 \leq \delta r/Da \leq 0.09$ , and the axial clearance gap ratio  $\delta a/Da$  is  $0 \leq \delta a/Da \leq 0.06$ .

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16. The fan motor using a rolling bearing according to claim 15, wherein the pockets of the retainer, each of which is shaped so that the radial clearance gap ratio  $\delta r/Da$  is  $0 \leq \delta r/Da \leq 0.09$ , and the axial clearance gap ratio  $\delta a/Da$  is  $0 \leq \delta a/Da \leq 0.06$ , are disposed at substantially equal spaces in  
15 at least three places.

17. A rolling bearing, which is lubricated with a grease, comprising:

20 an outer ring having a rolling raceway track on its inner peripheral surface;

an inner ring having a rolling raceway track on its outer peripheral surface;

a plurality of rolling elements disposed between the  
25 respective raceway tracks of the outer ring and the inner ring;

and

a retainer having a plurality of pockets for locking the rolling elements to freely roll and formed of resin material,

wherein when a diameter of the rolling element is taken  
5 as  $D_a$ , a radial clearance gap between a pocket face of the pocket and a rolling face of the rolling element is taken as  $\delta_r$ , and an axial clearance gap between the pocket face of the pocket and the rolling face of the rolling element is taken as  $\delta_a$ ,  
in the case where the grease containing 20 mass % or less thickener  
10 is used, at least one of the pockets of the retainer is shaped so that the radial clearance gap ratio  $\delta_r/D_a$  is  $0 \leq \delta_r/D_a \leq 0.09$ , and the axial clearance gap ratio  $\delta_a/D_a$  is  $0 \leq \delta_a/D_a \leq 0.06$ .

15 18. The rolling bearing according to claim 17, wherein the pockets of the retainer, each of which is shaped so that the radial clearance gap ratio  $\delta_r/D_a$  is  $0 \leq \delta_r/D_a \leq 0.09$ , and the axial clearance gap ratio  $\delta_a/D_a$  is  $0 \leq \delta_a/D_a \leq 0.06$ , are disposed at substantially equal spaces in at least three places.

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19. A fan motor using a rolling bearing lubricated with a grease, the rolling bearing comprising: an outer ring having a rolling raceway track on its inner peripheral surface; an inner ring having a rolling raceway track on its outer peripheral  
25 surface; a plurality of rolling elements disposed between the

respective raceway tracks of the outer ring and the inner ring;  
and a retainer having a plurality of pockets for locking the  
rolling elements to freely roll and formed of resin material,  
wherein, when a diameter of the rolling element is taken as  
5  $D_a$ , a radial clearance gap between a pocket face of the pocket  
and a rolling face of the rolling element is taken as  $\delta_r$ , and  
an axial clearance gap between the pocket face of the pocket  
and the rolling face of the rolling element is taken as  $\delta_a$ ,  
in the case where the grease containing 20 mass % or less thickener  
10 is used, at least one of the pockets of the retainer is shaped  
so that the radial clearance gap ratio  $\delta_r/D_a$  is  $0 \leq \delta_r/D_a \leq$   
 $0.09$ , and the axial clearance gap ratio  $\delta_a/D_a$  is  $0 \leq \delta_a/D_a \leq$   
 $0.06$ .

15 20. The fan motor using a rolling bearing according to  
claim 19, wherein the pockets of the retainer, each of which  
is shaped so that the radial clearance gap ratio  $\delta_r/D_a$  is  $0$   
 $\leq \delta_r/D_a \leq 0.09$ , and the axial clearance gap ratio  $\delta_a/D_a$  is  $0$   
 $\leq \delta_a/D_a \leq 0.06$ , are disposed at substantially equal spaces in  
20 at least three places.